

Russian rocket engine test safely shut down

The Oct. 14 test firing of a Russian-built engine was terminated approximately 2.7 seconds into a planned 56-second duration test at the Marshall Center.

Marshall's Advanced Engine Test Facility and the RD-180 engine were safely shut down after last week's firing. Post-test inspection of the engine hardware revealed no evidence of damage. Test data and hardware will be further evaluated to determine what caused the early shutdown.

A decision on when to schedule the next engine test firing will be made after results of the Oct. 14 test are analyzed.

The Marshall Center is under a Space Act Agreement with Lockheed Martin Astronautics of Denver to provide a series of test firings of the Atlas III propulsion system configured with the Russian-designed RD-180 engine. The tests are designed to measure the performance of the Atlas III propulsion system, which includes avionics and propellant tanks and lines, and how these components interact with the RD-180 engine.

Here for Von Braun Forum 'The Capitol Steps' to appear here Oct. 30

by Jack Robertson

The Capitol Steps, a troupe of former congressional staffers turned comedians, will be at the Marshall Center Oct. 30.

Members of the group will talk about their work as congressional staffers, present a video highlighting their best performances, and answer questions from

See *Capitol Steps* on page 3

STS-95 mission set to launch Oct. 29; Glenn to conduct microgravity studies

by Bob Thompson

Following completion of a flight readiness review meeting, NASA managers set Oct. 29 as the official launch date for the STS-95 mission aboard the Shuttle Discovery. During the Space Shuttle Discovery's scheduled nine-day flight, seven astronauts will conduct more than 80 scientific experiments — including 54 Marshall-managed Microgravity Research Program experiments.



The mission marks the return of John Glenn to space — 36 years after his history-making flight aboard Friendship 7 in February 1962 — as the first American to orbit the Earth.

"This flight will demonstrate the flexibility and importance of the Space Shuttle through the vast array of scientific experiments and a challenging on-orbit crew timeline. Also, as we observe

NASA's 40th anniversary this month, we have the unique opportunity to refly

See *STS-95* on page 3



NASA photo

Center Director Art Stephenson honored during reception

Center Director Art Stephenson, right, is joined by his wife Loa at the Community Reception Oct. 19 at the U.S. Space & Rocket Center. NASA Administrator Dan Goldin, left, and U.S. Rep. Bud Cramer also attended the reception honoring Stephenson.

"Safety pays in many ways"

Safety slogan submitted by Stephen Tucker, EP63

Workshop to take teachers, students on an exciting space journey

by Joy Carter

Mysterious holes in space, Earth-shattering meteor showers and searching for life on other worlds are just a few of the topics to be explored at a teacher-student workshop Oct. 23-24 at the Von Braun Center.

The "Catch On To Space Science and Astronomy" workshop will include lectures, hands-on activities, exhibits and an evening at the Von Braun Astronomical Society Planetarium and Observatory. The workshop is open free to teachers and students in grades 10-12.

"The workshop will present new discoveries in space science and astronomy in an entertaining and informal atmosphere," said conference organizer Dr. Alan Harmon of the Marshall Center.

"We believe teachers and students will find the material exciting and we hope to entice students to consider science or

technology as their field of study in college," said Harmon, an astrophysicist in Marshall's Space Sciences Laboratory.

The following sessions will be presented at the workshop:

★ **A Stellar Revue** — a star's life from birth to death

★ **Searching for Extraterrestrials Near and Far** — the chances for life on other worlds and what we can learn from life on Earth

★ **Dinosaurs and Meteor Strikes** — how space can change life on Earth in a big way

★ **What About Those Photons?** — how we see the universe

★ **Black Holes, Blazars and Quasars** — the "fix'd heavens" are anything but; it's active out there

★ **Working in High Places** — what does it take to be part of the space team?

Teachers and students will receive

certificates for their participation in the workshop, and teachers will be given a computer disk of workshop materials for use in the classroom.

Advance registration is required and enrollment is limited to the first 100 applicants. More information, a schedule of when sessions will be presented and registration forms may be found at the following Web site:

<http://www.batse.msfc.nasa.gov/~cotsa/>

Or, contact conference organizer Dr. Alan Harmon at 544-4924 or co-chair Maitrayee Sahi at 544-1373.

The Marshall Center and the Universities Space Research Association are hosting the workshop. Funding is provided by NASA's Initiative to Develop Education through Astronomy and Space Science (IDEAS) under the auspices of the Space Telescope Science Institute in Baltimore, Md.

Center pledges \$212,563 after second week of CFC

The Marshall Center's 1998 Combined Federal Campaign (CFC) has collected \$212,563 from employees after two weeks of the campaign, Center CFC officials said last week. The average gift per person has increased to \$218.46 with 973

employees participating. Last year's figures after two weeks show the average gift was \$195.24 with 893 employees participating.

The average gift this year is higher than it has been in the past three years, said CFC chairperson Cathy Nicholson.

"Employees are really participating in the online method of implementing their pledges," said Nicholson. "By making pledges through 'Inside Marshall,' there is no need to go back to the solicitor or monitor. It makes the financial chair's job much easier. The electronic version is better than expected."

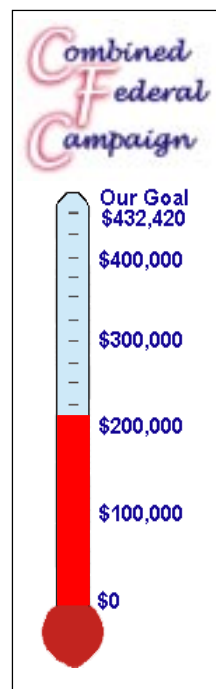
At the time of the report, center offices that achieved 100 percent participation include: AB01, AM01, BF01, BF70, CE01, CO40, CR90, EB11, JA01, JA02, JA10, JA21, JA41, JA51, JA52, JA63, MG10, PP01, PP04, SA45, TA61.



NASA photo by Emmett Given

Kearns spreads word on microgravity research

Marshall's Microgravity Research Program manager Joel Kearns discusses the role of microgravity research in the fight against cancer with WJLA-TV in Washington, D.C. Kearns participated in a series of live television interviews about NASA microgravity cancer research with television stations across the country as part of a nationwide information outreach campaign in recognition of National Breast Cancer Month. Kearns also discussed the role of the upcoming STS-95 Space Shuttle mission scheduled for launch Oct. 29 and its many microgravity cancer-related research investigations.





Courtesy photo

The Capitol Steps, a troupe of former congressional staffers turned comedians, will be at Marshall Oct. 30. Members of the political satire musical will talk about their work as congressional staffers, present a video highlighting their best performances, and answer questions from 4-5 p.m. in Morris Auditorium. The Capitol Steps will be in Huntsville to perform at the Von Braun Celebration to be held Oct. 30 in the North Hall of the Von Braun Center.

Capitol Steps

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4-5 p.m. in Morris Auditorium in Bldg. 4200.

Their Marshall Center appearance will be free and open to the public, but seating is limited. Those interested in attending must call Rosa Kilpatrick at 544-0042 to reserve seats.

The group started in 1981 when three staffers for U.S. Sen. Charles Percy created song parodies and skits for a Christmas party. They came up with a special brand of satirical humor that focused on events in Washington, D.C. Since that beginning the cast has grown to 22 members and they perform more than 400 shows a year all over the United States.

The Capitol Steps have recorded 18 albums and appeared on three nationally broadcast PBS specials. They also perform four times a year on National Public Radio stations nationwide during their "Politics Takes a Holiday" radio specials.

The Capitol Steps will be in Huntsville to perform at the Von Braun Celebration to be held Oct. 30 in the North Hall of the Von Braun Center.

Hosted by The National Space Club and the Marshall Center, the dinner honors the memory of Dr. Wernher von Braun. It recognizes individuals and groups who have made great achievements in advancing space flight programs and who have contributed to U.S. leadership in the fields of rocketry and astronautics. For the first time this year the celebration will combine the Von Braun Memorial Reception and Dinner/Awards and Exploration Forum into a single event.

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the first American to orbit the Earth. John Glenn is certain to see, firsthand, the advances in human space flight from the early beginnings of the Mercury program to the construction of the International Space Station," said NASA's Johnson Space Center Director George Abbey.

After Space Shuttle Discovery lifts off, STS-95 crew member John Glenn will begin work on a variety of investigations important to public health challenges and better products for industry.

Besides being the subject of various life science experiments on the aging process, the veteran space traveler will work as a payload specialist, or scientist in orbit. In the near-weightlessness of space, Glenn will activate and monitor microgravity experiments aimed at improving fundamental scientific knowledge. His research results will be used for product-oriented commercial applications in such diverse fields as medical, agriculture and manufacturing.

Once on orbit, Glenn will activate several investigations to aid researchers' efforts in the search for new drugs and treatments for life-threatening diseases. In one, he will gather important information in the search for a new substitute blood for transfusions. By carefully controlling plant growth conditions, he may develop information for new pharmaceutical compounds. He will monitor an investigation to grow a new synthetic bone transplant tissue. And Glenn will activate and monitor an investigation to study a material called Aerogel, a substance with tremendous insulating capacity and potential use in many everyday products and homes.

Here are additional details about microgravity experiments Glenn will activate and monitor over the nine-day mission.

Aerogel: Aerogel is the lightest solid known and a remarkable insulator. Nicknamed "frozen smoke" for its blue hazy appearance, a single window pane of Aerogel has the insulation effect of up to 30 panes of regular glass and trapped air. NASA researchers will test to see if the haze comes from the different sizes of pores or voids in this material, a form of silica gel. Such variations may account for light scattering in various directions, giving the material a cloudy appearance. Mixed in the near-weightlessness of space, the Aerogel test sample is expected to reveal whether absence from gravitational effects produces pores of a uniform size — making Aerogel more transparent or clear.

Experiment samples may result in a clear version of the usually hazy Aerogel, and lead to a revolution in manufacturing greatly improved thermal-protected household windows. By using clear Aerogel as a high-tech insulation, consumers could conserve energy and save money by lowering heating and cooling costs.

Advanced Separation commercial payload: The ability to separate different cells, and cell components, from one another accurately and reliably is critical to the development of new and

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improved medical treatments for a variety of illnesses.

Microencapsulation: Enclosing a drug in a tiny sphere for better delivery into the human body, a process called microencapsulation has the potential to provide a number of new medical treatments for cancer by reducing the side effects of chemotherapy. During this mission, investigators hope to encapsulate two complementary drugs, an anti-tumor drug and an immune stimulant, to create a potent time-released drug for colon cancer.

Recombinant Hemoglobin Research: This investigation will allow researchers to evaluate advanced technology for developing a genetically engineered hemoglobin product. Development of such a product could result in it becoming a replacement for whole human blood in transfusions.

ASTROCULTURE™ - The ASTROCULTURE™ facility provides a controlled environment in which to grow plants in the near-weightlessness of space. With Glenn's help, researchers will study the composition of volatile plant oils — an important substance that gives plants flavor and fragrance. They also will look at whether genes can be transferred from bacteria to soybean seedlings in space. If successful, the gene transfers could result in soybean plants that are more disease resistant. Soybeans are an important export crop for the United States valued at over \$14 billion annually.

BioDyn - The BioDyn Bioreactor is a facility that combines a culture vessel with the ability to grow live cells in space in rotating cylinders — called bioreactors — for medical research on diseases such as cancer and diabetes or for growth of new replacement tissues.

Protein Growth: This experiment will use the BioDyn bioreactor to grow a protein with potential to reduce or prevent the human body from rejecting transplanted tissues.

Microencapsulation: This research is focused on improving microencapsulating materials, so that insulin-producing cells may one day be implanted directly in the human body. This would allow the patient to be free from current treatments that involve daily insulin injections.

Synthetic bone: This research explores how to make artificial and synthetic materials implantable in the human body by seeding the foreign material with human bone cells. This will help researchers better understand how synthetic bone can be used to treat bone-related illnesses, bones damaged by accidents, dental reconstruction, long-bone grafts and coatings for orthopedic implants such as hip replacements.

Heart patches: This research is aimed at growing "heart patches" — used to replace damaged heart muscle — in the centimeter-size range or about a half-inch in diameter. Previous experiments in near-weightlessness have grown tiny millimeter-size heart patches. This innovative research may lead to early commercial development of heart patches.

Anti-cancer drugs: This research is aimed at production of anti-cancer compounds from plant cells. Cell cultures derived

from soybean cells have shown promise in commercial labs on Earth in the production of anti-cancer drugs.

Protein Crystal Growth - Glenn will activate and monitor protein crystal growth experiments aboard the Shuttle to support and improve biomedical and biotechnology research for commercial applications and fundamental science investigations. Pure, precisely ordered protein crystals of sufficient size and uniformity are in high demand by drug developers. Through these large crystals, researchers may be able to unlock the secrets of how to stop a disease. Protein crystals grown on the ground often cannot be grown as large or as well-ordered as researchers desire, obscuring these vital pathways to cures. Glenn will be involved with growing four protein crystal growth experiments during the mission.

Human insulin: Better information on the structure of human insulin may enable researchers to design new and longer lasting treatments for diabetes.

Chagas' Disease: Two types of crystals will be grown aboard Discovery that may lead to better understanding of this deadly parasitic disease that attacks the muscles of the body and affects over 20 million people throughout the world.

Pike Parvalbumin: Parvalbumin are found in the muscles, endocrine glands, skin cells, and some neurons of vertebrates, but the role they play in the muscles is not yet understood. Researchers are exploring theories of a connection between parvalbumin levels and the speed at which mammals' muscles relax before and after contraction.

Respiratory Syncytial Virus: Respiratory Syncytial Virus is an infection that attacks respiratory airways and lungs. Each year nearly four million U.S. children ages 1 to 5 are infected. Approximately 100,000 of these children require hospitalization, and 4,000 die annually from resulting infection. Crystals of the neutralizing antibody against Respiratory Syncytial Virus grown during the STS-85 mission in August 1997 were larger and of higher quality than those grown in previous studies, an encouraging step in the fight against this affliction.

Microencapsulation Electrostatic Processing System: The Microencapsulation Electrostatic Processing System will be used to form and harvest microcapsules. This new facility uses electrostatic fields to add coatings to make the microcapsules more effective. Researchers are exploring "multi-layered" microcapsules as a new way of combating cancer and improving chemotherapy treatments.

Using a multi-layered microcapsule, a chemotherapy treatment can be placed directly into cancerous tumors through one of the tumor's blood vessels. As the microcapsule swells, it blocks the blood vessels in and around the tumor so that the chemotherapy treatment remains concentrated in the tumor. This swelling also reduces the blood supply to the tumor, strangling the unwanted tumor growth.

More information about Marshall's Microgravity Research Program experiments may be found at:
<http://www.msfc.nasa.gov/news> and
<http://microgravity.msfc.nasa.gov/MICROGRAVITY/>

Upcoming Events

'A Tuskegee Airman's Tale' topic of AIAA dinner program set for Oct. 22

The American Institute of Aeronautics and Astronautics (AIAA) will host a dinner program from 6-8 p.m. Oct. 22 at the Holiday Inn Research Park to hear "A Tuskegee Airman's Tale."

Retired U.S. Air Force Lt. Col. Herbert E. Carter will talk about his experiences as a fighter pilot in World War II. Carter is an original member of the 99th fighter squadron — the Tuskegee Airmen who were the first black Army-Air Force squadron.

For more information, contact Tony Springer at 544-1571 (Tony.Springer@msfc.nasa.gov) or Tom Hancock at 961-4002 (Thomas.Hancock@hsv.boeing.com).

Hazard Communication training scheduled for Nov. 9, 10 and 12

Employees who routinely work with hazardous chemicals are required to attend Hazard Communication training.

Classes will be held for civil service and on-site contractors Nov. 9, 10 and 12 in Bldg. 4200, room G-13.

Classes will be offered at the following times each day: 7:30-8:30 a.m., 9-10 a.m., 12:30-1:30 p.m. and 2-3 p.m.

The registration deadline is Tuesday, Nov. 3. For more information, contact David Thaxton at 544-8371 or e-mail David.Thaxton@msfc.nasa.gov with first and second choice of date and time attendance preferences.



NASA photo by Jack Ray

Qual-Com demonstrates new technology product

Representatives from Qual-Com, a member of the Biz Tech Small Business Incubator, demonstrate to Marshall employees a new technology product that integrates presentation charts and video. They made the presentation to Marshall's Technology Transfer Office Director Sally Little, second from left, and employee Benita Hayes, seated left. Looking on from right, are Qual-Com employees Jeff Schneider, Kirk Wiles, Cindy Brenham, seated, and Angie Baker.

Barret elected AIAA Associate Fellow

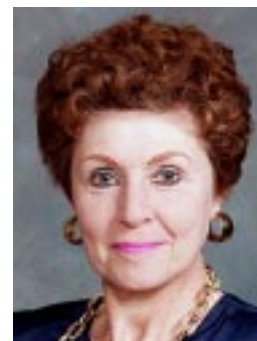
Dr. Chris Barret of Marshall's Propulsion Research Division has been elected to the grade of Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA).

AIAA Associate Fellows are individuals of distinction who have made notable and valuable contributions to the arts, sciences or technology of aeronautics or astronautics.

One of Barret's contributions that resulted in her election as an AIAA Fellow includes the design of flight control augmentors for advanced launch vehicles.

Barret, who is the lead for advanced mission technology planning, is one of 133 Associate Fellows elected for 1999.

She will be awarded the honor at the Inaugural Associate Fellow Dinner in January during the 37th AIAA Aerospace Sciences conference in Reno, Nev.



Dr. Chris Barret

Obituaries

Hendrix, Jessie, 61, Gurley, Ala., died Oct. 9. Hendrix retired from Marshall in 1988 where she worked in the Management Operations Office as an equipment specialist. She is survived by her sons Kevin Hendrix and Kenneth Hendrix.

McKelvy, Shirley, 66, Bailyton, Ala., died Oct. 18. At the time of her death, McKelvy worked in Marshall's Structural

and Dynamics Laboratory as a management support assistant. She began working at Marshall on June 18, 1962. McKelvy is survived by her husband Herbert McKelvy.



Shirley McKelvy

Employee Ads

Miscellaneous

- ★ Air stepper, weight bench, exercise bike, antique trunk, cash register, office supplies, dishes. 880-8464
- ★ Sleeper sofa, queen size, beige w/brown and blue stripes, \$175. 922-9387
- ★ Bunk beds, including mattresses, \$150. 883-2125
- ★ Floral tapestry sofa, burgundy wing-back chairs. 922-5727
- ★ Two sets of 1998 McDonald's teenie beanie babies, still in bags, make offer. 895-9520
- ★ Soundblaster multi-media kit, includes SB16 and external CDROM, \$60. 461-8721
- ★ Little Tykes country kitchen unit, \$60; 40-piece toy utensil and food set, \$15. 922-9387
- ★ Craftsman 12" wood lathe w/motor and accessories, including metal table w/2 drawers, \$390. 881-6962
- ★ Extra large jungle gym, 3-level twin towers, wood w/vinyl accessories, tube slide, \$500 obo. 837-9794
- ★ Ryobi gas blower vacuum, \$75. 881-6436
- ★ Golf clubs with cart, \$40; stereo, \$60; portable typewriter, \$10. 536-8951
- ★ Shopsmith model 500 w/most accessories, \$2,500. 882-0567
- ★ Hunt desk, refrigerator, gravity exercise machine, Apple computer and scanner, pine hutch and dining room set, Lane recliner. 721-1169

Vehicles

- ★ 1988 Mercury Marquis, gray, all electric, automatic, 70K miles. 967-2727
- ★ 1974 Volkswagen Beetle, \$2,495. 851-0893
- ★ 1995 Nissan Maxima SE, heated leather, security system, Bose audio, sunroof, power seats, \$15,500. 539-0094
- ★ 1986 Mazda 626, 4-dr., blue, 1.8L, 186K miles, AT/PS/PB, A/C, AM/FM cassette, \$1,100 obo. 883-4744
- ★ 1996 Dodge Neon Highline, 38K miles, \$6,700. 586-7246
- ★ 1988 Toyota Camry LE wagon, auto, V-6, 118K miles, \$5,500. 882-1448
- ★ 1987 Chevrolet Silverado truck, V-8, automatic, A/C, cover, bedliner, 85K miles, \$4,995. 883-1110
- ★ 1991 Chevrolet Astro, 135K miles, dual A/C, trailer hitch, seats 7-8, \$2,750 obo. 464-0660
- ★ 1990 Buick Century, custom, white, 4-dr., PS/PBB, cassette, \$3,000. 837-9338

- ★ 1998 GMC Yukon SLT, white, 12K miles, leather, rear A/C, CD, PW/PL, tow package, \$28,000. 828-7998

Wanted

- ★ Tandem axle trailer, 16'. 233-5533
- ★ Four or eight track recorder. 922-5727

Center Announcements

- ✦ **AIAA** — The American Institute of Aeronautics and Astronautics' 1998 Defense and Space Programs Conference is scheduled Oct. 28-30 at the Von Braun Center. Admission is paid for all Marshall civil service employees with NASA/MSFC badges required for admittance. See the October calendar of the AIAA home page at: <http://www.aiaa.org/>
- ✦ **Alabama A&M University Lecture** — Alabama A&M University will host the first Putcha Venkateswarla Memorial Lecture at 3 p.m. Fri., Oct. 23, in Dawson Auditorium at Alabama A&M. A reception will be held at 5 p.m. in the West Campus Reception Area. Dr. Robert Curl of Rice University, recipient of the 1996 Nobel Prize in chemistry, will speak. **Contact:** Prof. Ravi Lal at 858-8148 or Jerome Saintjones at 858-4863
- ✦ **Las Vegas Trip** — Executive Tour & Travel Service, Inc., through the NASA Exchange at Marshall is offering a Las Vegas Great Escape for only \$169 per person, based on double occupancy. The offer includes a 4-day/-night hotel and entertainment package at the Stardust, the Riviera or the Sahara Resort and Casino; round trip transfers to and from McCarran International Airport for two people; daily two-for-one buffet meals; two-for-one admission to live shows, plus much more. A deposit of \$145 by Oct. 30 is required. **Contact:** Executive Tour & Travel at 1-800-272-4707. The NASA Exchange account reference is ER11583-003 and is available to Marshall employees, retirees and on-site contractors.
- ✦ **Shuttle Buddies** — The Shuttle Buddies will meet for breakfast at 9:15 a.m. Oct. 26 at Shoney's on University Drive West. **Contact:** Deemer Self, 881-7757
- ✦ **Lunar Nooners** — The NASA Lunar Nooners Toastmasters Club will meet at 11:30 a.m. on Tuesday, Oct. 27 in the Bldg. 4610 cafeteria conference room. All Marshall employees, contractors and friends are invited. **Contact:** Lee Johns, 544-5241

- ✦ **MARS Ballroom Dance Club** — The MARS Ballroom Dance Club will offer polka and tango lesson from 7-8 p.m., Nov. 2, 9, 16 and 23 in the Parish Hall of St. Stephen's Episcopal Church, 8020 Whitesburg Drive. Lesson cost is \$8 per person and available to MARS Ballroom Dance Club members and their partners/guests. **Contact:** Pat Sage, 544-5427
- ✦ **NARFE** — The National Association of Retired Federal Employees (NARFE), Chapter 736, will meet at 11 a.m. Wednesday, Oct. 26, at Morrisons's Cafeteria in Decatur. Debra Rains, director, Morgan County Commission on Aging will be the guest speaker. All retired federal employees are invited. **Contact:** 355-2874 or 773-4826
- ✦ **Quality Lab Reunion** — The second reunion luncheon of the Quality Laboratory will be held at 11 a.m. Nov. 12 at the Redstone Officers Club. Reservations are required. **Contact:** Frank Batty, 536-9187, Art Carr, 881-8432, Dick Henritze, 534-8312 or P.M. Hughes, 881-1937.
- ✦ **MESA** — The Marshall Engineers & Scientists Association (MESA) will hold its monthly membership meeting at 11:30 a.m. Oct. 22 in Bldg. 4471, room C-105. Refreshments will be served.
- ✦ **Nut Sale** — The Marshall Exchange annual nut sale will soon be under way. This year, the Exchange will be selling pecan halves, chocolate pecans, three types of almonds, pistachios, English walnuts and raw peanuts. The sale will begin prior to Thanksgiving. Nuts will be on sale in Bldg. 4752 on a first-come first-served basis to employees, retirees and on-site contractors. More information on pricing and delivery will be available soon.
- ✦ **Flu Shots** — The annual administration of flu shots to all on-site personnel will be provided at Marshall's Medical Center from 2:30-4:30 p.m. Oct. 29 and Nov. 3.
- ✦ **Full Cost Training** — Full Cost training for Marshall employees will be held from 8 a.m.-4:30 p.m. Oct. 22 and Nov. 12 at the Sparkman Center on Martin Road, Bldg. 5304, room 4331/33; and Nov. 18 at the Sparkman Center in Bldg. 5304, room 4347/49. Employees may register for the eight-hour training via ADMINSTAR. **Contact:** Stephanie Elliott, 544-7553, Janie McCrary, 544-7552, Lisa Martin, 544-4374

Job Opportunity

CPP99-3-PL, General Engineer, GS-801-15, S&E, Mission Operations Laboratory, Office of the Director. This announcement is Center-wide. Closes Nov. 2.

MARSHALL STAR

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